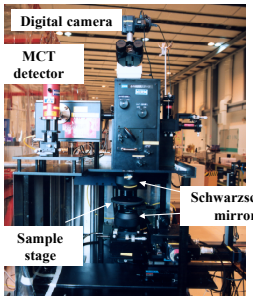
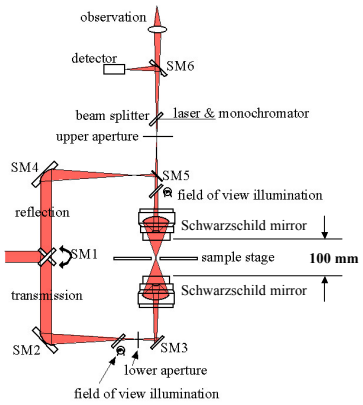
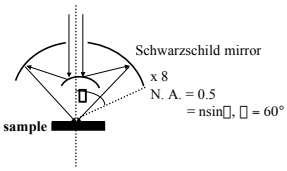
Infrared microspectroscopy station







Window between the microscope and FTIR
BaF2, KRS-5, polyethylene film

The working distance of our microscope is long, and the various attachments can be installed.

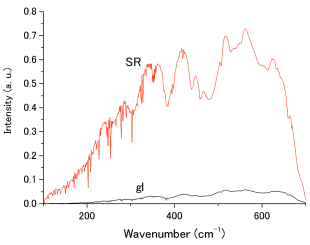
- •x-y mapping stage
  minimum step 1 □m
- •flow-type cryostat
  Oxford microstat-He
  Temperature 4.2 ～ 400 K
  Window: Quartz, KRS-5, BaF2, polyethylene film
- •high temperature DAC
  RT ～ 1000 K, ～30GPa
- •low temperature DAC
  10 ～400 K, ～20GPa
  Window: Quartz, KRS-5, BaF2, polyethylene film

Infrared microspectroscopy station

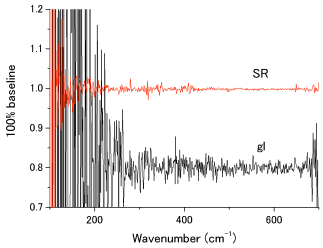
Far infrared region

Air transmission spectra

Detector	Si-bolometer
Resolution	2 cm^{-1}
Accumulation number	64

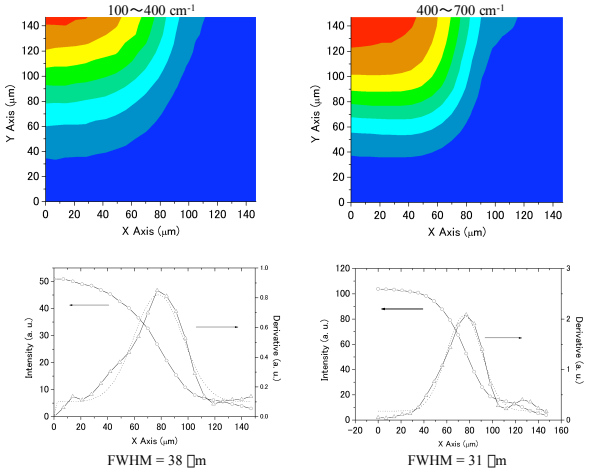


SR = gl x 20 @300 cm^{-1}



noise @300 cm^{-1} SR:5%
gl:10%

the reflection intensity from the edge of the Au mirror



FWHM = 38 □m

FWHM = 31 □m

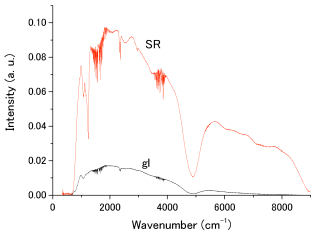
Diffraction limit D = □□/NA
in the case □ = 0.61 (Rayleigh limit)
D = 20 □m @ 600 cm^{-1}
D = 40 □m @ 300 cm^{-1}

Infrared microspectroscopy station

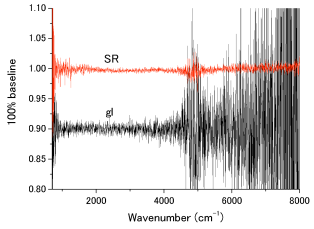
Mid infrared region

Air transmission spectra

Detector	MCT
Resolution	4 cm^{-1}
Accumulation number	124

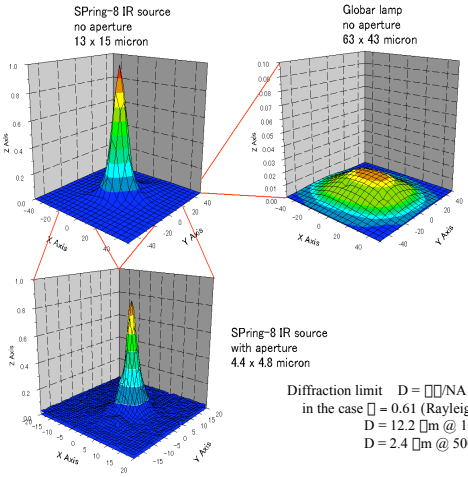


SR = gl x 5.6



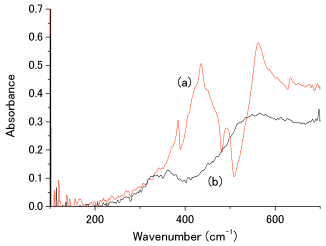
noise @2000 cm^{-1} SR:1.4 %
gl:2.26 %

Beam profile at the focal point of the microscope through 2 □m pinhole
(700 ～9000 cm^{-1})



Diffraction limit D = □□/NA
in the case □ = 0.61 (Rayleigh limit)
D = 12.2 □m @ 1000 cm^{-1}
D = 2.4 □m @ 5000 cm^{-1}

Results



Absorption spectra of alumina polycrystals

Heat treatment of alumina hydrate produces a series of transition aluminas, such as □-, □-, and so on, before final conversion to the most stable □-phase Al2O3.

(a) □-phase, ～30 □m diameter
(b) □-phase, ～ 40 □m diameter

Magneto-optical spectroscopy station

Spectral range	800 ～ 20000 cm^{-1}
Magnetic filed	～14 T
Temperature	～4 K
Spatial resolution	10 □m